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Annual Report on Numerical Study of Strong and Coherent Radiation of Terahertz Electromagnetic Waves from High-T_c Superconductors

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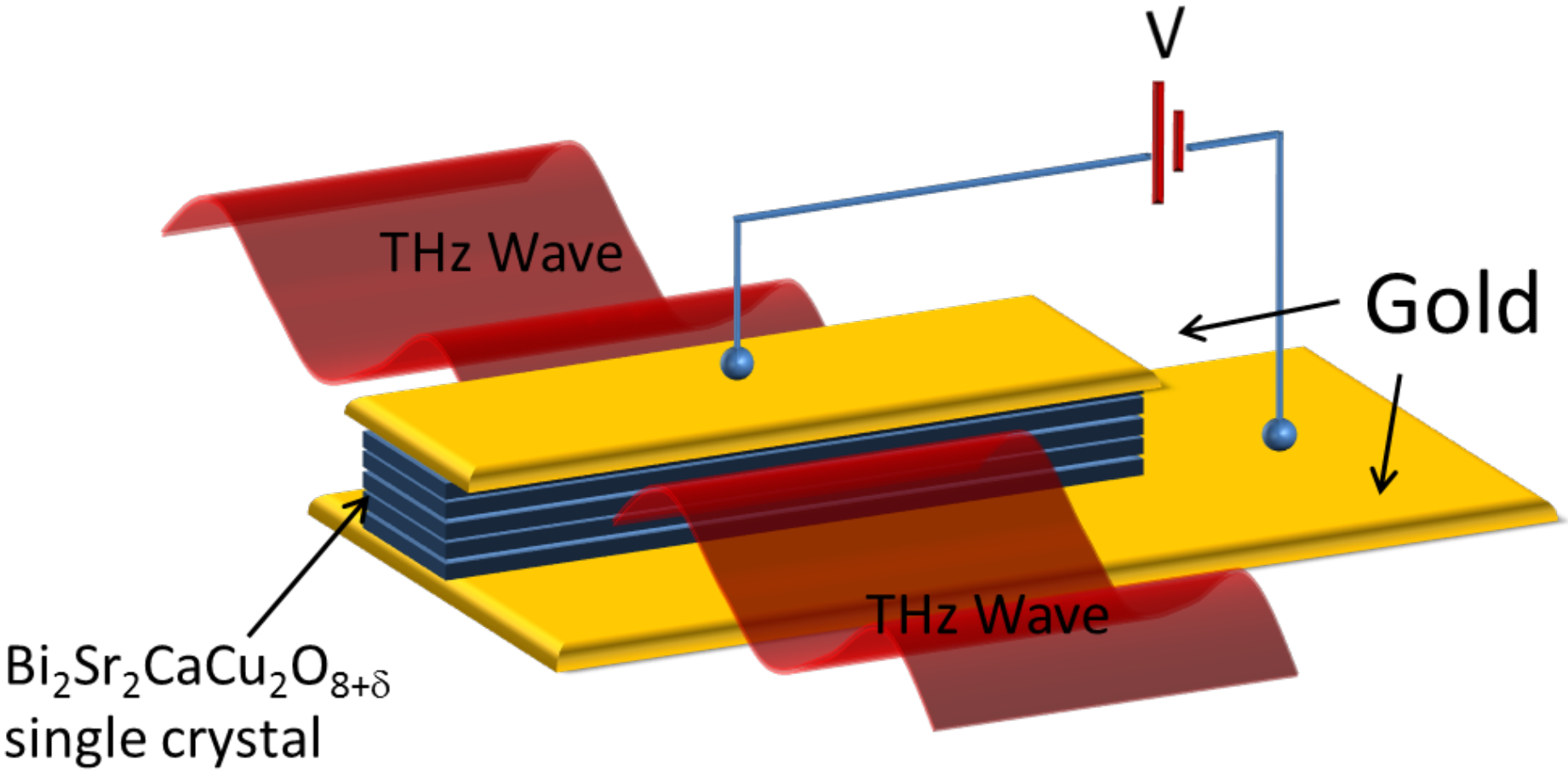

Fig. 1, schematic view of the setup for THz radiation from cuprate superconductors.

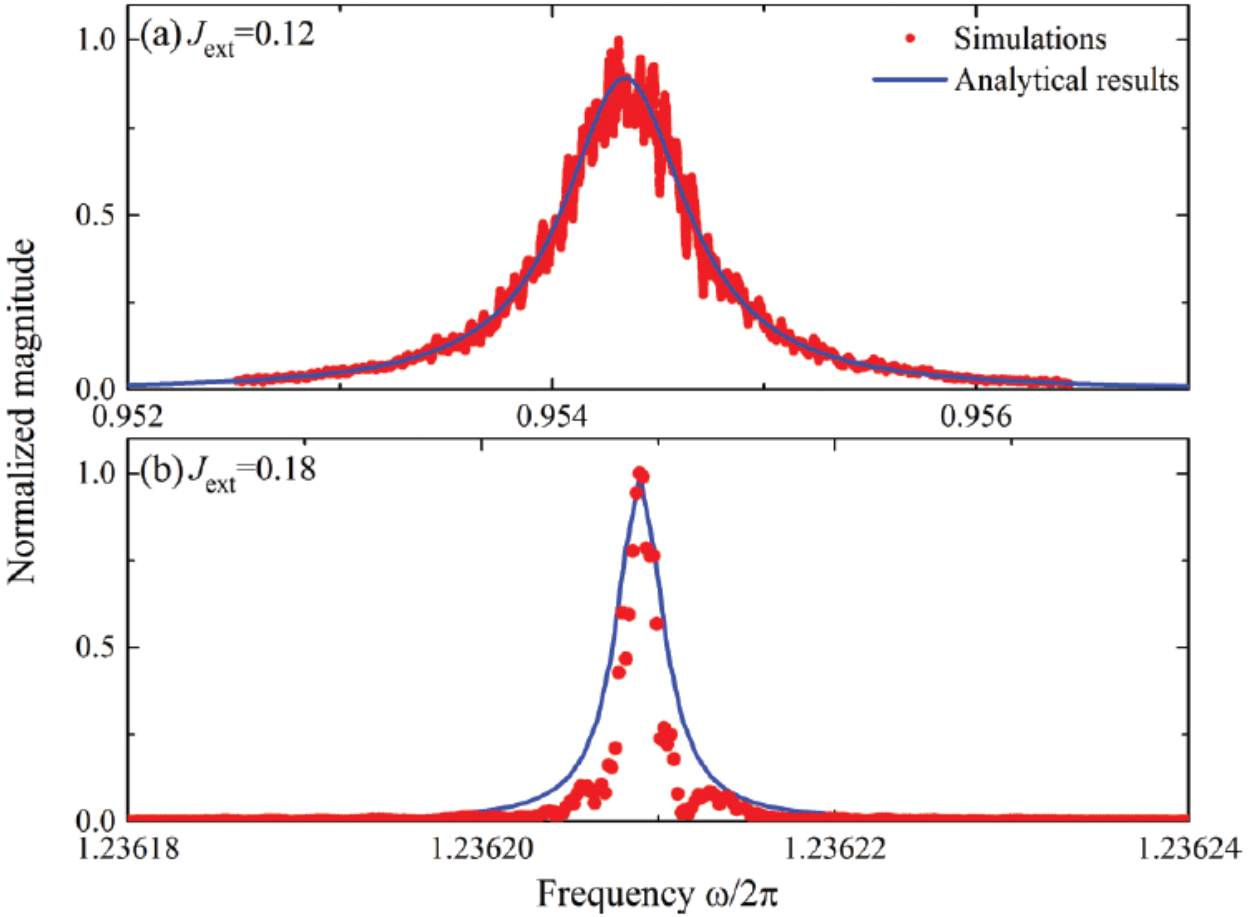

Fig. 2, Comparison of the line shape obtained analytically and numerically both off the resonance (a) and at the resonance (b). The linewidth sharpens significantly at the cavity resonance.

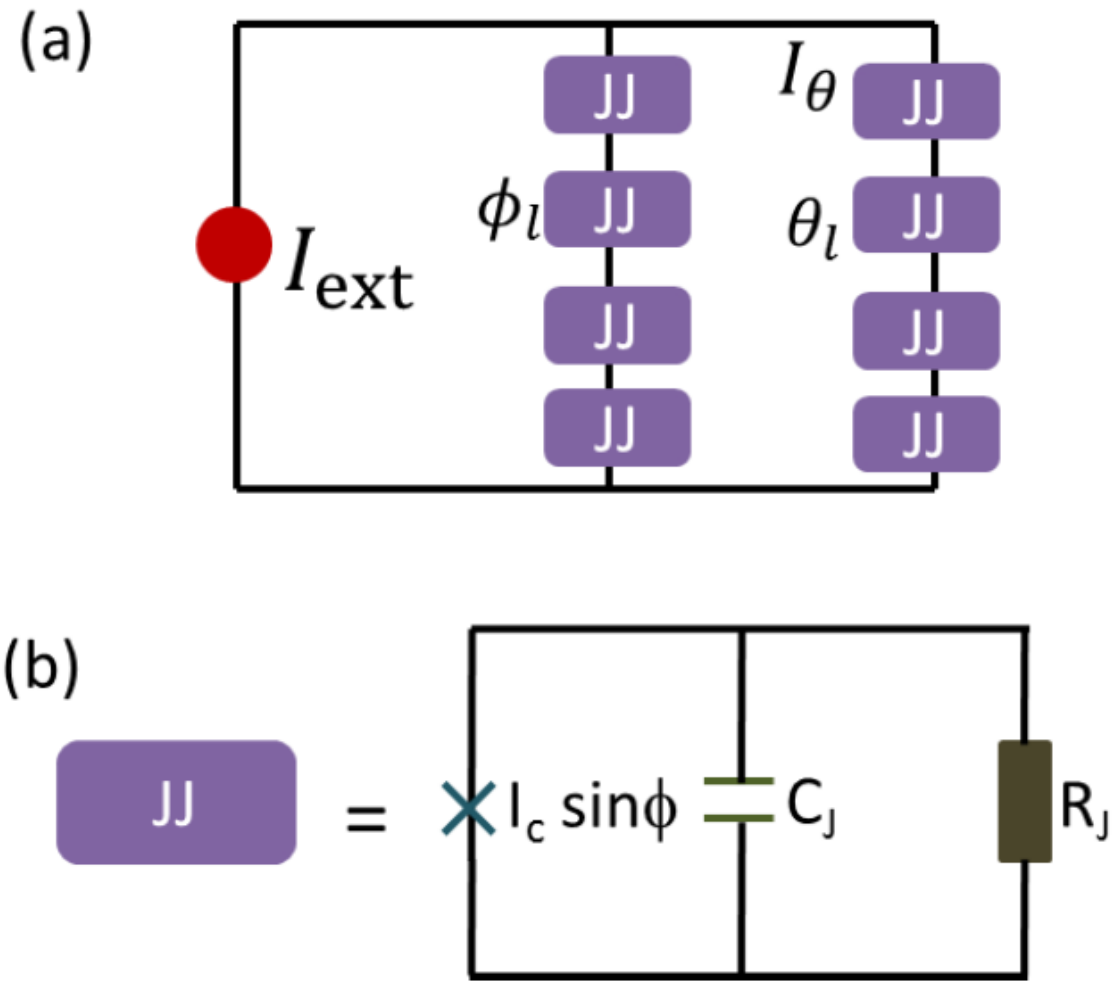

Fig. 3, (a) Schematically view of two stacks of intrinsic Josephson junctions shunted in parallel and biased by a dc current. In order to tune the phase difference between the plasma oscillation in the two stacks by a magnetic field, the wire connecting all the junctions should also be superconducting. (b) The Josephson junction is modeled as a shunt circuit of a capacitor, a resistor, and a nonlinear Josephson current.

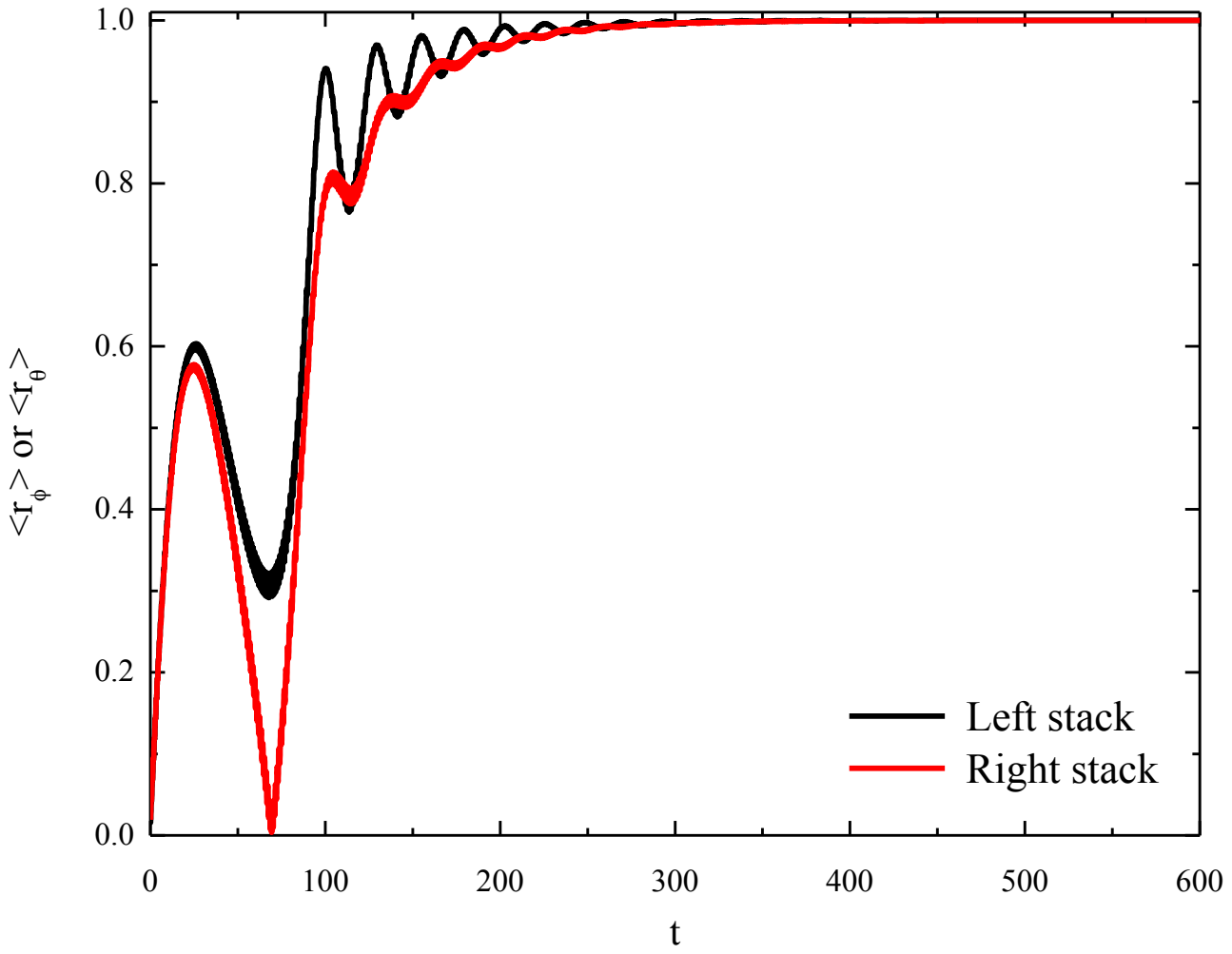

Fig. 4, (a) Amplitude of the order parameter as a function of time starting from a completely random state for number of junctions equal to 400. The junctions are fully synchronized when the order parameter is equal to 1.